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Optimizing Plant Productivity Using Site-Specific Crop Management (Field 5a-c)
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Objectives: The objective is to describe the interactive biological effects of site-specific water, nutrient, weed, arthropod, and disease management on crop growth and production in an irrigated corn system. The goal is to reduce variability in yield across management units but to have a management system that maximizes the economic profitability of each management unity, and collectively maximizes economic return for the field.

Methodology: In late May 2001, short-season drought tolerant corn hybrid Pioneer 3223 was planted on a half-circle on Helms Farm in Halfway, Texas. Nitrogen was applied at three rates (110, 185, and 240 lbs N ac^{-1}) on entire passes on the half-circle. These nitrogen rates were applied based on depth to caliche and soil texture within each irrigation span for a total of three spans in the experiment. One rate of irrigation was applied to the experiment, expecting variations in the soil texture, depth to caliche, and CEC to lead to spatial variability in soil water and plant growth responses. In season data collection occurred within 12 m^2 of each DGPS location (see Figure 1) set the previous year. Data collection consisted of bimonthly soil moisture readings, canopy reflectance measurements, and plant growth measurements. The cornfield was harvested using a John Deere Greenstar Yield Monitoring combine.

Results: Samples collected in 2001 are still being processed and other data collected has not been completely analyzed. However, the goal of analysis will be to take 2000 and 2001 data and created a prescription for field management. Parameters for defining crop management zones will be set forth based on previous experiments, and implemented on a new field location in 2002.
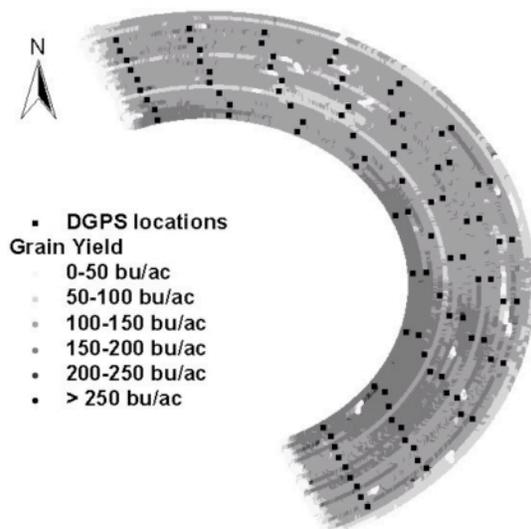
Figure 1. Grain yield (bu ac^{-1}) collected with the John Deere GreenStar Yield Mapping Combine.